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A PROPOSAL FOR UNIVERSAL SERVICE  
AND ACCESS REFORM

by

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\*The authors are, respectively, Chief Economist and Senior Staff Economist at the FCC. We have benefitted enormously from countless conversations and helpful discussions with staff at the FCC, including Jay Atkinson, Pat DeGraba, Aaron Goldschmidt, Jane Jackson, Richard Lerner, Robert Pepper, Don Stockdale, Larry Strickling, and Yog Varma. We would also like to thank Howard Shelanski for helpful conversations. All remaining errors are our own. All conclusions and views expressed are solely those of the authors and do not reflect any official FCC position.

## OUTLINE

- \* 1. ~~Introduction~~
- 2. Calculating Deaveraged Loop Cost
- 3. Choice of Caps and the Size of the Universal Service Fund
- 4. Funding Mechanisms
- 5. A Variation Which Allows Averaged Prices
- 6. Conclusion

## THE CURRENT SYSTEM FOR RECOVERING COMMON LINE COSTS

1. Common line cost is the cost of providing the loop between the end user and switch
  - over half of all network cost
  - this cost element is the main source of geographic variation in cost of providing local telephone service (i.e., switching and trunking costs display less geographic variation.)
2. FCC responsible for setting prices that allow recovery of 25% of total common line costs
3. Total amount of common line costs that an ILEC can recover in the interstate jurisdiction determined by price cap formula
4. recovery methods allowed by FCC
  - direct per line charges to end users (SLC)
  - per line charges to IXC's (PICC)
  - per minute charges to IXC's (CCL)
5. common line dollars recovered in the interstate jurisdiction:

SLC	\$8.3 billion
PICC	\$1.7 billion
CCL	\$1.7 billion
TOTAL	\$11.7 billion

## IMPLICIT SUBSIDIES AND FEES

1. Cost of providing common line varies greatly depending on population density and other factors.
2. Recovery of costs is highly averaged within class of residential users and within class of business users.  
Business users pay more than residential users
3. Low cost/business lines pay implicit fees which are used to provide implicit subsidies to high cost/residential lines.

## THE PROBLEM WITH IMPLICIT SUBSIDIES AND FEES

1. low cost/business users
  - ILEC loses customers to CLECs even when the ILEC has lower costs
2. high cost/residential users
  - CLECs have no incentive to compete for this business even if they are lower cost providers than the ILEC
3. Too much competition for low cost/business users and too little competition for high cost/residential users
4. Problem #1:
  - inefficient entry decisions
5. Problem #2:
  - funding source of subsidies is threatened
6. The Policy Issue
  - Congress still wishes to subsidize some classes of users and types of services.
  - Congress would rather not distort entry incentives and needs to use a funding source that is not threatened by competition.

## THE PROPOSED SOLUTION: DEAVERAGED PRICES WITH EXPLICIT AND COMPETITIVELY NEUTRAL SUBSIDIES AND FEES

1. Use a cost model to calculate deaveraged flat charges for loops which sum to permitted revenues
  - methodology described in more detail in following section
2. Choose caps by class of lines
  - e.g.:

primary residential	\$4.50
secondary residential	\$6.50
multiline business	\$9.50
3. ILEC charges each line the calculated deaveraged cost up to the maximum of the cap
4. For lines with a cost above the cap, the ILEC receives a subsidy equal to the amount that cost exceeds the cap by.
5. Subsidies also available to CLECs if they serve the line.
6. Fund subsidy through fees on all telecommunications firms. Alternative fees:
  - percentage of interstate revenue
  - percentage of all (interstate and intrastate) revenue
  - per line fee on all lines

## FEDERAL VS. STATE JURISDICTION

1. Proposal only affects 25% of costs in Federal jurisdiction
2. Therefore, there is a sense in which the proposal only solves 25% of the problem.
3. Rationale:
  - FCC has no direct jurisdiction over how 75% of costs in state jurisdiction are recovered and whether or not they are deaveraged
  - most straightforward initial step is to deaverage prices in the federal jurisdiction and create portable subsidies for users that are thought to need them
  - creates a template for states to follow

## JOINT BOARD PROPOSALS

1. Board has focused on subsidies for intrastate common line costs
  - Should the FCC provide explicit subsidies to ILECs that have high cost lines without reducing the amount of money the ILECs are allowed to collect for interstate access?
  - Presumably leaves headroom for states to lower prices supporting intrastate common line costs
2. This proposal focuses on subsidies for interstate common line costs
  - Should the FCC provide subsidies to ILECs that have high cost lines while simultaneously reducing the amount of money that the ILECs are allowed to collect for interstate access?
3. Proposals are generally complementary



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## CALCULATING DEAVERAGED LOOP COST

1. Calculation begins at the study area level.
2. Use forward looking cost model to determine loop cost of each wire center

$f_j$ , forward looking loop cost for wire center  $j$   
 $F$ , forward looking common line cost for study area

3. Use price cap formula to determine allowed common line revenue

$R$ , permitted common line revenue

4. The Inflation Factor:

$$i = R/F$$

5. Deaveraged loop cost for each wire center is calculated by inflating forward looking loop cost by inflation factor

$c_j$ , deaveraged loop cost for wire center  $j$   
 $c_j = i \times f_j$

6. For simplicity, the wire centers in a study area will probably be divided into three regions and an average loop cost will be calculated for each region

## CALCULATING DEAVERAGED LOOP COST(Cont'd)

6. Deaveraging of costs is revenue neutral for the ILEC;
  - if ILEC charges the deaveraged loop cost for every loop in the study area, the ILEC will earn the revenues permitted under price caps
7. Key idea: Two different issues
  1. Should the overall level of access charges be lowered?
  2. Should access charges be deaveraged?
8. Issue #2 is less controversial than issue #1. One reason that no progress has been made on issue #2 is that people have thought that the issues were linked.
9. This proposal shows how to obtain the benefits of deaveraging for ANY over-all level of access charges.
10. No changes are suggested to the over-all level of access charges simply to emphasize the fact that this is a separable issue.

## EXAMPLE

1. Wire-centers in each study area are grouped into three groups

region 1: low cost group                      lowest 50% of lines

region 2: medium cost group                  next 25% of lines

region 3: high cost group                    highest 25% of lines

2. average loop cost calculated for each group within the study area

## Loop Costs by Company\*

(\$ per month)

Company	Group 1	Group 2	Group 3
Alliant	3.19	3.80	11.03
Ameritech	4.50	5.20	7.53
BA	5.55	6.75	11.1
BS	5.04	6.92	12.30
Cincinnati	4.74	5.49	7.92
Frontier	3.80	4.42	7.08
GTE	5.72	8.16	18.20
PAC	4.24	4.74	6.60
SWB	4.23	5.23	9.65
SNET	4.79	5.42	7.25
Sprint	6.17	9.15	16.42
USW	4.95	6.21	10.95

\*Method for calculating loop costs.

1. 1998 permitted revenue for each ILEC provided by common carrier bureau
2. Forward looking loop costs by wire center provided by FCC cost model
3. For each ILEC, deaveraged loop costs by wire center are calculated by inflating forward looking loop costs proportionately so that ILEC will recover permitted revenue if it charges prices equal to the deaveraged loop costs.
4. For each ILEC, wire centers divided into three groups based on deaveraged loop cost (low cost- lowest 50% of loops; medium cost next 25% of loops; high cost - highest 25% of loops)
5. Average value of loop cost calculated for each group of wire centers.

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## CURRENT LEVELS OF FLAT CHARGES

1. Average level of permitted revenue per line across all price cap LECs is \$6.86.
2. Resulting Current Average Levels of Flat Charges

	SLC	PICC	TOTAL
Primary Residential	\$3.50	\$.53	\$4.03
Secondary Residential	\$6.07	\$1.50	\$7.57
Multiline Business	\$6.86	\$2.75	\$9.63

3. Plan under 1997 Access Reform Order
  - all caps except cap on primary residential SLC will rise over time until all lines pay the same flat charge
  - primary residential PICC will rise by \$.50 per year

## CHOICE OF CAPS

### 1. Two possible alternatives

	Alt. #1	Alt. #2
primary residential	\$4.50	\$6.50
secondary residential	\$6.50	\$6.50
multiline business	\$9.50	\$9.50

### 2. Size of Explicit Subsidy Fund required

Alternative #1:	\$3.2 billion
Alternative #2:	\$1.9 billion

### 3. The levels of flat charges for primary res. that will result from the 1997 access reform order could be mirrored by beginning with alternative #1 and then increasing the primary res. cap by \$.50 per year until alternative #2 was reached.



## THE EFFECT OF INCREASING THE NUMBER OF DEAVERAGED COST GROUPS

1. In general the size of the universal fund will grow as we create more groups.
  - fund is maximized by making each wire center its own group
2. In our case, the size of the fund with 3 groups is nearly as large as the size of the fund when every wire center is its own group. The fund sizes are as follows.

	every w.c. its own group	3 groups
Alternative #1	\$3.3 billion	\$3.2 billion
Alternative #2:	\$1.9 billion	\$1.9 billion

3. Tests of different methods of defining groups show that the universal service fund reaches very close to its maximum level with 3 groups so long as the high cost group contains between 15% and 30% of the total lines.

## IMPLICATIONS FOR CHOICE OF THE NUMBER OF GROUPS

1. the size of the fund does not grow significantly when we allow more than 3 groups
2. entry incentives are more finely tuned as we allow more groups
3. only disadvantage to creating more groups is administrative cost
4. should at least allow ILECs to define more than 3 groups if they wish

## CASH FLOWS BETWEEN GEOGRAPHIC REGIONS OF THE COUNTRY CAUSED BY THE PROPOSAL

1. Funding for universal service subsidies will come from all regions in proportion to end user revenues generated in each region or in proportion to number of lines in region.
2. Payment of universal service subsidies will flow disproportionately to high cost regions.
3. Result will be a net cash flow from low cost regions to high cost regions.

ESTIMATED CASH FLOWS BETWEEN REGIONS  
TREATING EACH ILEC'S AREA AS A SEPARATE  
REGION\*

(millions of dollars per year)

Company	Subsidy Received	Fee Paid	Net Subsidy
Alliant	3.6	2.8	.8
Ameritech	60	195	(135)
BA	415	479	(64)
BS	358	315	43
Cincinnati	4.3	10.7	(6.4)
Frontier	1.4	5.1	(3.7)
GTE	590	301	289
PAC	37	162	(125)
SBC	124	167	(43)
SNET	4.0	23.3	(19.3)
Sprint	184	97	87
USW	174	197	(23)
Total	1,955	1,955	0

\*Calculations are for alternative #2. Cash flows are larger under alternative #1.

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## FUNDING MECHANISMS

1. Three possible choices
  - fee based on interstate revenue
  - fee based on all (interstate and intrastate) revenue
  - per line fee on all lines
2. The traditional economic view of fee-induced distortions
  - If a revenue fee is only on interstate revenue, this is essentially a fee on long distance usage and will therefore have the same distorting effects as the CCL
  - If the revenue fee is broader based, much of the fee will be levied on non-usage based charges (such as loop charges). However a portion of it will still be levied on usage-based charges.
  - Fees based on usage of the network are inherently more distortive than fees based on lines because decisions over usage are much more elastic than decisions over lines.
3. Rankings from best to worst under the traditional economic view
  - per line fee
  - fee on all (interstate and intrastate) revenue
  - fee on interstate revenue

## FUNDING MECHANISMS (CONT'D)

4. The problem with traditional view is that decisions over number of lines may be elastic (multiline business, Centrex vs PBX, secondary residential, cellular)
5. Possible that a fee on all (interstate and intrastate) revenue may be better or not significantly worse than a per line fee.

## SIZE OF THE REQUIRED PER LINE FEE

### 1. Number of various types of lines (millions)

Residential	119
Single Line Business	4
Multiline Business	56
Special Access	41
Wireless	70
Total	290

### 2. Size of Universal Service Fund

Alternative #1                      \$3.2 billion

Alternative #2                      \$1.9 billion

### 3. Size of Required Per Line Fee (\$ per month)

Alternative #1                      \$.92

Alternative #2:                      \$.55



## A SINGLE PER LINE FEE FOR ALL UNIVERSAL SERVICE

1. If the new interstate universal service subsidy was funded by a per line fee, a desirable simplification might be to fund all universal service subsidies with a per line charge.

2. Size of Universal Service Funds

High Cost & Low Income	\$2.1 billion
Schools and Libraries	\$2.25 billion
Interstate (Alternative #1)	\$2.9 billion*
Interstate (Alternative #2)	\$1.6 billion**

Total (Alternative #1)	\$7.25 billion
Total (Alternative #2)	\$5.15 billion

3. Required per line fee to fund all universal service funds:

Alternative #1	\$2.08
Alternative #2	\$1.48

\* The calculation of the subsidy fund of \$3.2 billion for alternative #1 was obtained when the common line basket was assumed to equal \$11.7 billion, which included \$800 million of flowback. Since this flowback is directly included in the high cost and schools and libraries amounts, it must be subtracted from the \$11.7 billion to calculate the remaining required subsidy. Reducing the common line pool from \$11.7 billion to \$10.9 billion results in a \$300 million reduction in the calculated size of the interstate universal service fund.

\*\* The universal service fund under alternative #2 is reduced from \$1.9 billion to \$1.6 billion for the same reason as described above.

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## A VARIATION ON THE BASIC PROPOSAL

1. Continue to implement access charges as described in the 1997 access reform order (i.e., SLCs PICCs and CCLs charged just as currently planned)
2. Calculate deaveraged common line cost just as for the first alternative
3. ILEC's charge per line can be calculated as follows:  
$$\text{SLC rev.} + \text{PICC rev.} + \text{av. CCL rev. per line}$$
4. if ILEC charge is greater than deaveraged cost
  - customer is viewed as paying a fee equal to the difference
5. if ILEC charge is less than deaveraged cost
  - customer is viewed as receiving a subsidy equal to the difference
6. CLEC
  - required to collect the same fee on low cost lines that the ILEC is determined to be implicitly collecting
  - allowed to receive the same subsidy on high cost lines that the ILEC is determined to be implicitly receiving

## A VARIATION ON THE BASIC PROPOSAL (CONT'D)

### 7. Funding

- each ILEC breaks even by construction
- initially, fee collections from CLECs will exceed subsidy payments to CLECs

## THE MAIN DIFFERENCE BETWEEN THE BASIC PROPOSAL AND THE VARIANT OF THE BASIC PROPOSAL

1. Basic Proposal funded by a line fee
  - prices for loop are deaveraged
  - the same per line fee is levied on every line
2. Variant of Basic Proposal
  - prices are still averaged
  - implicit fees paid by ILEC lines are calculated
  - lower cost lines pay a higher implicit fee
  - same fee structure is applied to CLEC lines to guarantee competitive neutrality
3. The variant of the basic proposal can be viewed as being similar to the basic proposal funded by a line fee such that lower cost lines pay a higher line fee. (Which lines are eligible to pay the fee may also differ.)

## ISSUES FOR COMPARISON OF THE TWO PROPOSALS

### 1. Fee-Induced Distortions

Both proposals fund universal service subsidies through fees. Which fee system creates the smallest distortions and why?

### 2. Cost-Based Pricing

The basic proposal has the ILEC set price equal to cost for most loops. The variant has the ILEC charge the same price for every loop. Is there a sense in which the basic proposal is more deregulatory?

### 3. Fewer changes to access prices

The variant requires no changes to current access prices other than those called for in the 97 access reform plan. Does this make it significantly easier to implement?

### 4. Fees on CLECs

The variant imposes a new explicit per line fee on CLECs while it does not impose a new fee on ILECs. (For ILECs the current implicit fee is simply explicitly identified.) Is this politically feasible?

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## CONCLUSION

1. Current system of implicit taxes and subsidies

- entry decisions are distorted
- source of funding threatened

2. The Basic Proposal

- deaverage loop costs
- set price equal to loop cost subject to a cap
- ILEC paid subsidy for amounts above cap
- subsidies also made available to CLEC

3. Size of Required Fund:

Alternative #1 (\$4.50 prim. res. cap)	\$3.2 billion
Alternative #2 (\$6.50 primary res cap)	\$1.9 billion

4. Size of Required Per Line Fee to fund Interstate Subsidies

Alternative #1	\$.92
Alternative #2	\$.55

5. Size of Required Per Line Fee to fund all Universal Service Including the New Interstate Fund

Alternative #1	\$2.08
Alternative #2	\$1.48

6. Variant on Basic Proposal Corrects Entry Incentives while allowing current scheme of averaged access prices.